

CURRICULUM VITAE

Prof. Dr. Vitalii Dugaev

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Current position:

Associate Professor, Rzeszów University of Technology (Poland)

Permanent address:

Department of Physics and Medical Engineering
Rzeszów University of Technology
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Education:

- Professor title – 2014 (conferred by the President of Poland)
- Doctor of Science (Habilitation) in Physics – 1996. Chernovtsy State University (Ukraine)
- Senior Research Fellow, Academy of Sciences of the USSR – 1989. Moscow (Russia)
- PhD in Physics – 1980. Chernovtsy State University (Ukraine)
- MS in Electronic Engineering – 1968. Technical University in Lvov (Ukraine).

Career:

Since 1/10/2006: Associate Professor, Department of Physics, Rzeszów University of Technology (Poland).
2004-2015: Professor Catedrático Convidado (visiting professor), Department of Physics & Center of Physics and Engineering of Advanced Materials (CeFEMA), Instituto Superior Técnico, Lisbon (Portugal)
2011-2012: Mercator Professor, Department of Physics, Martin-Luther-Universität Halle-Wittenberg (Germany)
2002-2004: Scientist, Max-Planck-Institut für Mikrostrukturphysik, Halle (Germany).
2001-2002: Scientist, Instituto Superior de Engenharia de Lisboa (Portugal)
2000-2001: Scientist, Max-Planck-Institut für Mikrostrukturphysik, Halle (Germany).
1977-2010: Scientist and Head of Theory Department (since 1997), Institute for Problems of Materials Science, Ukrainian Academy of Sciences, Chernovtsy (Ukraine)
1970-1977: Scientist and Head of Theory Group (since 1975), Technical University, Lvov (Ukraine).

Visiting:

07/2015: Martin-Luther-Universität Halle-Wittenberg
02/2014: Radboud University, Nijmegen
08/2013-09/2013: MPI Mikrostrukturphysik, Halle
07/2011-09/2011: ESRF, Grenoble
06/2010-09/2010: Institut Néel, CNRS, Grenoble
06/2009-09/2009: ESRF, Grenoble & MPI Mikrostrukturphysik, Halle
07/2008-09/2008: ESRF, Grenoble
06/2007-09/2007: MPI Mikrostrukturphysik, Halle
06/2006-09/2006: Institut Néel, CNRS/UJF, Grenoble
01/2004-04/2004: Invited Professor, Joseph Fourier Université and Laboratoire Louis Néel, CNRS, Grenoble
03/2000-05/2000: Center of Theoretical Physics, Polish Academy of Sciences, Warsaw
05/1983-05/1984: One-year stage in Landau Institute for Theoretical Physics, Moscow

Teaching:

1974-1977 "*Semiconductor Physics*"; advisor of master thesis (9). Lvov Technical University
 1987-1990 Consulting classes & advisor of master thesis (1). Chernovtsy University
 1992-1994 "*Solid State Physics*", "*Semiconductor Physics*". Chernovtsy University
 2000-2005 Advisor of PhD students (2) and master thesis (1). Institute of Materials Science, Chernovtsy
 2004-2006 "*Advanced Condensed Matter Physics*", Instituto Superior Técnico, Lisbon.
 2006-2011 "*Physics I*", "*Solid State Physics*", "*Computer modelling*". Rzeszów University of Technology
 2011-2012 "*Advanced Condensed Matter Physics*". Martin-Luther-Universität Halle-Wittenberg
 2012-2016 "*Physics I*", "*Physics II*", "*Solid State Physics*". Rzeszów University of Technology

Supervisor of PhD thesis:

- Michał Ingot. "Impurity-induced magnetization and spin current generation in graphene", Rzeszów University, Poland. Thesis defined in 2012.
- Volodymyr Ivanov. "Influence of spin-orbit interaction on characteristics of low-dimensional structures", Chernovtsy University, Ukraine. Thesis defined in 2013.
- Zakhar Kudrynskyi. "Formation and properties of nanostructures based on layered crystals of indium and gallium selenides", Chernovtsy University, Ukraine. Thesis defined in 2014.

Research interests:

Solid state theory, methods of quantum field theory in statistical physics, magnetism, disordered systems, spintronics, semiconductor theory, heterostructures, nanostructures.

Publications:

9 book chapters, 1 book editor, 1 review article
 180 major publications in refereed journals (Physical Review B, Physical Review Letters, et al.)
 20 invited and 100 contributed talks at international conferences
 2000 citations, Hirsh index H=24

Invited talks:

Institute of Physics PAS, Warsaw, 1999; 2015
 Toruń University, 1999
 Warsaw University, 1999
 Jagiellonian University, Kraków, 2000
 Adam Mickiewicz University, Poznań, 2000; 2007; 2008; 2012
 Universität Regensburg, 2000; 2007
 MPI Mikrostrukturphysik, Halle, 2001; 2004
 Universität Graz, 2001
 MPI Komplexer Systeme, Dresden, 2001
 Instituto Superior de Engenharia de Lisboa, 2001
 Instituto Superior Técnico, Lisbon, 2002; 2004; 2008; 2011
 Humboldt-Universität Berlin, 2003
 Universität Würzburg, 2003
 Institute of Molecular Physics PAS, Poznań, 2003; 2004
 Institute Laue-Langevin, Grenoble, 2004; 2008
 Universidade de Lisboa, 2005
 Universidade do Minho, Braga, 2006
 Poznań University of Technology, 2007
 SPINTEC Research Laboratory, Grenoble, 2008
 Universität Halle, 2009, 2011
 Technische Universität Dresden, 2012
 Donostia International Physics Center, San Sebastian, 2012
 Technical University Lvov, 2013
 Radboud University, Nijmegen, 2014
 Universität Hamburg, 2014
 Universität Mainz, 2014

Awards:

Two awards of the International Science (Soros) Foundation – 1992 and 1993
 Mianowski Science Fellowship (Poland) – 2000
 NATO Science Fellowship – 2001
 Gulbenkian Professorship (Portugal) – 2004
 Eight Awards of the Rector of Rzeszów University of Technology – 2008–2015.
 Mercator Professorship (Germany) – 2011
 DAAD Fellowship (Germany) – 2013
 Medal for Merit, Rzeszów University of Technology – 2014

Research projects:

"Magnetic interactions in alloy low-dimensional structures ferromagnet-semiconductor EuS-PbS". Grant of Polish Committee for Scientific Research 2 P03B 109 12, 1997-1999.

"Development of physical principles of the molecular nanotechnologies of layered crystals". Grant of Science and Technology Center in Ukraine (sponsored by USA) No. 591, 1998-2000.

"Magnetic and electrical properties of rare earth based IV-VI semimagnetic semiconductors". Grant of Polish Committee for Scientific Research 2 P03B 154 18, 1998-2001.

"Spin-polarized electron transport and magnetic properties of magnetic nanostructures". Grant of Polish Committee for Scientific Research 5 P03B 091 20, 2001-2003.

"New generation of microthermometers and multifunctional sensors for use in cryogenic engineering and low-temperature physics". Grant INTAS No. 2000-0476, 2001-2004.

"Spin dependent transport in semiconducting and metallic magnetic multilayers". NATO Collaborative Linkage Grant PST.CLG.977615, 2001-2002.

"Spin electronics". Special project (zamowiany) of Polish Committee for Scientific Research PBZ/KBN/044/P03/2001, 2002-2005.

"Theory and computer simulation of new spintronic devices". Grant of Fundação para a Ciência e a Tecnologia (FCT) in Portugal No. 440.02, 2003 (**principal investigator**).

"Development of space technology of materials processing using directional crystallization". Grant of Science and Technology Center in Ukraine (sponsored by NASA) No. NN-36, 2000-2004.

"Transport properties of magnetic semiconductors and nanostructures with domain walls". Grant of Ministry of Science and Information in Poland 2 P03B 053 25, 2003-2006.

"Non-linear optic effects in wide-gap semiconductors". Grant FCT in Portugal POCTI/FAT/48822/2002, 2004-2007

"Manipulation of spin and charge currents in magnetic nanostructures". Grant FCT in Portugal POCI/FIS/58746/2004, 2000-2006 (**principal investigator**)

"Advanced semiconductor spintronics: Technology, theory and devices". Grant of Science and Technology Center in Ukraine (sponsored by EU) No. 3098, 2006-2008.

"Spin-dependent transport and electronic correlations in nanostructures". EU Project ESF/8/2006 Eurocores in field of Fundamentals of Nanoelectronics, 2006-2009.

"Electronic transport and current-induced spin dynamics in magnetic mesoscopic structures". Grant of Ministry of Science and High Education in Poland N202 142 31/2598, 2006-2009.

"Electronic transport and magnetic dynamics in low-dimensional magnetic systems and nanostructures". Grant FCT in Portugal PTDC/FIS/70843/2006, 2007-2010.

"Magnetic interactions and the spin polarized electric current in graphene". Grant of Ministry of Science and High Education in Poland N N202 3689 33, 2007-2010 (**principal investigator**).

"Electronic properties of novel FeAs-based superconductors". Grant FCT Portugal PTDC/FIS/101126/2008, 2009-2011.

"Transport and elastic properties of semiconducting magnetic structures". Grant of National Science Center in Poland, 2011-2014 (**principal investigator**).

"Theory of thermoelectric and thermomagnetolectric effect in graphene". Grant of National Science Center in Poland, 2011-2014.

"Nanostructured MgO tunnel barrier for metal-semiconductor spin injection". European project ERA.NET.RUS, 2012-2014. Rzeszów University of Technology in cooperation with Hamburg University and Institute of Crystallography in Moscow (**leader of the Polish partner**)

"Theory of electronic, magnetic and optical properties of semiconducting nanostructures with random spin-orbit field", 2013-2016. International cooperation project "Harmonia" sponsored by the National Science Center in Poland. Rzeszów University of Technology in cooperation with the University of Basque Country UPV/EHU in Bilbao, Spain (**principal investigator**).

Cooperation:

European Synchrotron Radiation Facility, Grenoble, France
 Max-Planck-Institut für Mikrostrukturphysik, Halle, Germany
 Martin-Luther-Universität Halle-Wittenberg, Germany
 Adam Mickiewicz University, Poznań, Poland
 Institut Néel, CNRS/UJF, Grenoble, France
 Radboud University, Nijmegen, The Netherlands
 WaveBand/Sierra Nevada Corporation, Irvine, CA, USA (consulting fellow)
 Universidad Autonoma de Madrid, Spain
 Universidad del País Vasco, Bilbao, Spain

Additional information

Areas of expertise:

- semiconductors (energy spectrum, impurity states, transport properties)
- magnetism, magnetic semiconductors, exchange interaction
- low-dimensional systems (quantum wells, wires, dots, superlattices)
- disordered systems, localization, mesoscopics

Skills in methods of theoretical physics:

- Green's functions, Feynman diagrams, functional integrals
- Keldysh technique of nonequilibrium processes
- bosonization
- supersymmetry in condensed matter theory
- renormalization group
- kinetic equation
- slave bosons, constrained theories, non-linear σ -models
- topology, Berry phase

Organization of conferences:

- *Physics of Ferroelectricity*, Chernovtsy, 1986
- *School-Conference on Theoretical Physics*, Chernovtsy-Moscow, 1990 (Chairman)
- *Materials Science of Semiconductors*, Chernovtsy – 1988, 1991, 1994, 1995, 1997, 1999
- *11th International School on Theoretical Physics SSPCM 2014*, Rzeszów, 2014 (Chairman)

Memberships:

- European Physical Society (EPS)

Refereeing:

- Physical Review Letters, Physical Review B, Journal of Physics, etc.
- National Science Foundation (USA)
- National Science Center (Poland)
- European Research Council Executive Agency (ERCEA)

Languages:

- fluent in English, French, German and Portuguese
- Ukrainian and Russian (native)

Personal information:

Born in Krasnodar (Russia), 1/11/45. Citizen of Ukraine. Resident in Poland.

Married to Tetyana Dugaeva, 10/06/67. Children: Sergey, 11/02/69 and Mikhail, 3/01/72

Home address: Strzelnicza 23/19, 35-103 Rzeszów, Poland.